

31 JAN 1969

PC-2

6961 NDE 1E

PROJECT

TEKTITE I

OPERATION PLAN



DEPARTMENT OF THE NAVY
OFFICE OF NAVAL RESEARCH
WASHINGTON, D. C. 20360

IN REPLY REFER TO

31 JAN 1969

From: Chief of Naval Research
To: Distribution List

Subj: Project TEKTITE I; operation plan for

Encl: (1) Operation Plan, Project TEKTITE I

1. Enclosure (1) is the operation plan for Project TEKTITE I. While the total schedule is discussed, the emphasis here is on Phase III, that portion directly concerned with the period during which the major experiment will be carried out.
2. Implementation of this plan is contingent upon approval of the Secretary of the Navy to use human subjects.
3. Commander F. L. Looney, USN, is hereby assigned as Project Director for Operations for this experimental phase of the program. This assignment becomes effective upon completion of a satisfactory test of all equipment on-site. The distribution list will be informed by message of the time of the start of this phase.

A handwritten signature in dark ink, appearing to read "T. B. Owen", is located below the typed text.

T. B. OWEN

Distribution List:

CNO
ASN (R&D)
CINCLANTFLT
COMSERVLANT
COMPHIBLANT
COMCBLANT
COMCARIBSEAFRON
ACB 2
COM 10 ND
COMNAVAIRLANT
NAVSTA SJUAN
NAVSTA ROOSRDS
OCEANAV
CNM
DSSP (PM11)
SUPSAL
NAVFACENGCOM
NAVSHIPSYSKOM
CH BUMED
COM/USCG
CG DET SJUAN
CHINFO

Info copies to:

All participating activities not listed above

PROJECT
TEKTITE I
OPERATION PLAN

A COMPREHENSIVE EXPERIMENT CONCERNING THE PERFORMANCE OF A SCIENTIFIC MISSION UNDER ISOLATED (SATURATED DIVING) CONDITIONS OVER AN EXTENDED PERIOD OF TIME. CONDUCTED BY THE OFFICE OF NAVAL RESEARCH IN COOPERATION WITH THE DEPARTMENT OF THE INTERIOR, NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, GENERAL ELECTRIC COMPANY, NAVAL FACILITIES ENGINEERING COMMAND, BUREAU OF MEDICINE AND SURGERY, ELEMENTS OF THE U. S. ATLANTIC FLEET, AND OTHERS.

PROJECT TEKTITE I

INTRODUCTION

TEKTITE I is a program to determine the effectiveness of a small group of men performing a scientific research mission while living isolated on the ocean floor (under saturated diving conditions) for a long period of time.

Four marine scientists will live for a period of sixty days in the TEKTITE I habitat on the ocean floor at a depth of approximately fifty feet. The site is Greater Lameshur Bay, St. John, Virgin Islands, chosen for its favorable climate, clear waters, and abundant tropical plant and animal life.

The four aquanaut marine scientists will swim from the habitat each day to conduct various scientific projects. They virtually will be living in a marine laboratory, both on the ocean floor and in the habitat's working spaces.

While the four marine scientists are conducting their underwater research mission, they will be continuously observed by behavioral and biomedical teams. The objectives are to identify man's psychological and physiological reactions to long-term mission performance in an isolated, hostile environment common to undersea and space missions.

The program is divided into five major phases:

PHASE I: Program design and equipment design and fabrication/procurement, assembly and checkout.

PHASE II: Facility Establishment on-site and equipment installation and check-out.

PHASE III: Major experimental phase. Aquanaut occupation of habitat.

PHASE IV: Equipment withdrawal and dispersal.

PHASE V: Reduction, analysis and distribution of data and results.

This operation plan is mainly concerned with Phase III; outlines of Phases II and IV are included.

PROJECT TEKTITE I

OPERATION PLAN

1. MISSION: To establish an underwater habitat for a small scientific party and to provide personnel and facilities required to study the group's ability to conduct a scientific research program while under saturated diving conditions over an extended period of time.

2. PARTICIPATING ACTIVITIES: See ANNEX A.

3. AUTHORITY: See ANNEX B.

3.1. Overall Program Management: The Office of Naval Research has been selected as lead agency and provides the chairman for an inter-agency steering group which makes all decisions regarding the overall program. ONR, as lead agency, is responsible for the integration of these decisions into a joint (overall) program management plan.

3.2. Phase I: Program design and Equipment design and fabrication; procurement, assembly and checkout. This phase has been completed under the ONR program manager.

3.3. Phases II and IV: Facility establishment on-site and equipment installation and check-out and Equipment withdrawal and dispersal. The Naval Facilities Engineering Command has accepted the responsibility for the installation and withdrawal of facilities and equipment at the site. An Officer-in-charge of Construction has been assigned, and is the senior officer responsible for the on-site efforts during these phases. He is assisted by elements of the Atlantic Fleet (PHIBLANT ACB-2), and other participating activities as required.

3.4. Phase III: Major experimental phase. The Project Director for Operations designated by the Chief of Naval Research shall exercise command

and control over all project facilities, equipments, events, and personnel on the scene during this major experimental phase. He shall be responsible for insuring safety, good order, and discipline.

3.5. Phase V: Reduction, analysis and distribution of data and results. Will be handled separately.

4. PROJECT SITE: Habitat is located in Greater Lameshur Bay, St. John, U. S. Virgin Islands, and is supported by a base camp ashore. This site is on U. S. Territory under control of the U. S. Park Service, which has issued a use permit for the duration of TEKTITE I. Details are found in ANNEX C.

5. EXTERNAL RELATIONS: See ANNEX D.

6. COMMUNICATIONS: See ANNEX E.

7. LOGISTICS: See ANNEX F.

8. SAFETY: See ANNEX G.

9. OPERATION PLAN: See ANNEX H.

10. ADMINISTRATION: See ANNEX J.

ANNEX A

ANNEX A

PARTICIPATING ACTIVITIES

A.1. NAVY

a. Office of Naval Research

(1) Headquarters

- (a) Prime contracting agency
- (b) Overall program management
- (c) Scientific program coordination
- (d) Direction of on-site operations
- (e) Planning of psychological program
- (f) Planning of physiological program
- (g) Coordination of public affairs plan
- (h) Coordinating logistic support
- (i) Funding support
- (j) Overall safety responsibility

(2) Naval Biological Laboratory

- (a) Planning and execution of microbiological studies
- (b) Personnel and equipment for microbiological studies
- (c) Provide, as needed, medical-microbiological support
- (d) Microbiological assessment over data analysis

b. Naval Facilities Engineering Command

- (1) Design and test of habitat installation methods
- (2) Design and coordination of installations on the support AMMI barge.

ANNEX A

- (3) Engineering and material support relative to design and installation of base camp
- (4) On site installation and retrieval of habitat and other equipment
- (5) On site engineering personnel

c. U. S. Atlantic Fleet

- (1) Amphibious Construction Battalion TWO
 - (a) Implementation and evaluation of habitat installation methods and equipment
 - (b) Assembly of support AMMI barge installation
 - (c) Primary design, construction, and operation of base camp
 - (d) Furnish material and equipment for base camp construction
 - (e) Operation and maintenance of habitat support system
 - (f) On site support personnel
- (2) Amphibious Force, Atlantic Fleet (PHIBLANT)
 - (a) Transportation for habitat system, base camp equipment and materials, and project personnel to TEKTITE site and return

d. Bureau of Medicine and Surgery

- (1) Naval Submarine Medical Center
 - (a) Development and testing of decompression schedules
 - (b) Participation in planning and execution of physiological and biomedical/safety programs

ANNEX A

- (c) Diver physical and psychiatric examinations
- (d) Providing medical personnel for planning and on-site support
- (2) Naval Medical Research Institute
 - (a) Planning and execution of the behavioral observation program
 - (b) Personnel for planning and on-site operations
 - (c) Supporting equipment and technician assistance
 - (d) Data analysis assistance
- (3) Naval Medical Neuropsychiatric Research Unit
 - (a) Planning and execution of the sleep studies
 - (b) Support equipment
 - (c) On-site and planning personnel support
 - (d) Data analysis assistance
- (4) Chief, Bureau of Medicine and Surgery
 - (a) Assistance in preparing medical safety plans
 - (b) Final approval of medical/safety plan
 - (c) Assistance in obtaining medical personnel support

A.2. DEPARTMENT OF THE INTERIOR

- a. Planning and overall management of ocean floor scientific program
- b. Funding support
- c. Diver personnel - four primary crew and two back-up divers
- d. Support equipment for ocean floor program

ANNEX A

- e. Support personnel for ocean floor program
- f. Operational site in the Virgin Islands National Park
- g. Operational support on site
- h. Safety Review

A.3. NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

a. Headquarters

- (1) Overall agency management, technical direction and coordination
- (2) Funding support
- (3) Data management assistance
- (4) Behavior program support
- (5) Scientific program coordination
- (6) Safety review

b. Manned Spacecraft Center

- (1) Preparation and implementation of psychomotor test
- (2) Personnel and equipment support for sleep/awake studies
- (3) Personnel and equipment support for hematology program
- (4) Technical support for biomed experiment
- (5) Technical support for medical safety program

c. Marshall Spaceflight Center

- (1) Habitability technical coordination and liaison

d. Langley Research Center

- (1) Atmospheric sensor equipment support
- (2) Swimmer equipment support
- (3) Technical and equipment support for psychomotor tests

ANNEX A

A.4. GENERAL ELECTRIC COMPANY

a. Missile and Space Division

- (1) Habitat design and fabrication
- (2) Program integration assistance
- (3) Technical support for behavioral, physiological and medical/safety programs
- (4) Preparation of planning documents
- (5) Personnel and technical support for on-site operations
- (6) Provide habitat

A.5. COAST GUARD

- a. Diver support personnel for emplacement and support diving

A.6. COLLEGE OF THE VIRGIN ISLANDS

- a. Marine biological studies support

A.7. UNIVERSITY OF PENNSYLVANIA

- a. Biomedical Sciences Coordination and Support

ANNEX B

ANNEX B

AUTHORITY

B.1. Phases II and IV: The organization of the Command Structure during these phases will consist of an Officer in Charge of Construction (OICC) designated by the Naval Facilities Engineering Command, a technical advisory staff on Habitat Engineering designated by the General Electric Company, a detachment from Amphibious Construction Battalion TWO, and a team of Engineers and Technicians from the General Electric Company, plus other temporarily assigned personnel as required. An organizational chart for phases II and IV is attached as Appendix I to this Annex.

B.2. Phase III

B.2.a. General: The organizational structure for this operational phase is under the overall command of a Project Director for Operations (designated by the Chief of Naval Research in the promulgation letter for this operation plan), who is hereafter referred to as the Project Director. The Assistant Project Director (Research and Engineering), hereafter referred to as the Assistant Director, assists the Project Director as specified in article B.2.b.2. of this Annex. The Inter-Agency Program Managers, hereafter referred to as Program Managers, act in an advisory capacity to the Project Director. Finally, there are Team Leaders for the six functional teams as described in articles B.2.c.1. through B.2.c.6. These six team leaders shall report to the Project Director and shall ensure that their activities are coordinated through the Assistant Director.

ANNEX B

An essential element of this structure is continuous free liaison among all concerned; the Project Director must be kept fully informed at all times of mission progress and of important factors and significant events which may affect the mission.

Appendix II to the Annex is a graphic chart of this organizational structure.

B.2.b. Project Director and Assistant Director

1. Project Director for Operations (hereafter referred to as Project Director): will assume on-site command as Overall Project Director when directed by the Chief of Naval Research on or about 15 February 1969. In this capacity, he will exercise control over Phase III of Project TEKTITE, reporting to the Chief of Naval Research for operational and administrative control and to Commander, Caribbean Sea Frontier/Commandant 10th ND for area coordination. He will keep all Commands concerned fully informed of the progress of TEKTITE.

2. Assistant Project Director (Research and Engineering) (hereafter referred to as Assistant Director): will plan, coordinate and monitor the scientific and engineering functions and will keep the Project Director advised in these matters.

B.2.c. Team Leaders

1. Habitat/Van Engineering Team: The leader for this team will be assigned by the General Electric Company. He will be responsible

ANNEX B

to the Project Director for the proper operation of the complete habitat system. He will designate system engineers as necessary to ensure that a knowledgeable individual is on watch at all times during mission, as well as during emplacement and test events. He will keep the Project Director fully informed at all times on the operation of the habitat system and of any anticipated problem areas. He shall direct the engineering team of contract personnel and coordinate all activities through the Assistant Director.

2. Support Operations Team: The leader for this team (hereafter referred to as Support Officer) will be assigned by the Naval Facilities Engineering Command. He will be responsible to the Project Director for operation of the base camp, surface diving operations, boat schedules, and for administrative control of military personnel assigned to base camp. He will be assisted by the Officer-in-Charge, ACB2, TEKITE Detachment. He shall furnish operating personnel as necessary for support machinery, the base camp, and surface support diving.

3. Aquanaut Team: The leader of this team will be assigned by the Department of the Interior. He will be responsible to the Project Director for the activities of the aquanauts. He will supervise the aquanaut team, ensuring that the established schedules are maintained, keeping in mind that the safety of the aquanauts is

ANNEX B

paramount at all times. He shall keep the Project Director fully informed at all times on the status of mission schedule, and of the status of divers, equipment and conditions within the habitat. He shall conduct necessary drills and exercises to insure that personnel are prepared to cope with all established emergency procedures. He will establish the required watches within the habitat and conduct routine tests of equipment to ensure safe operation.

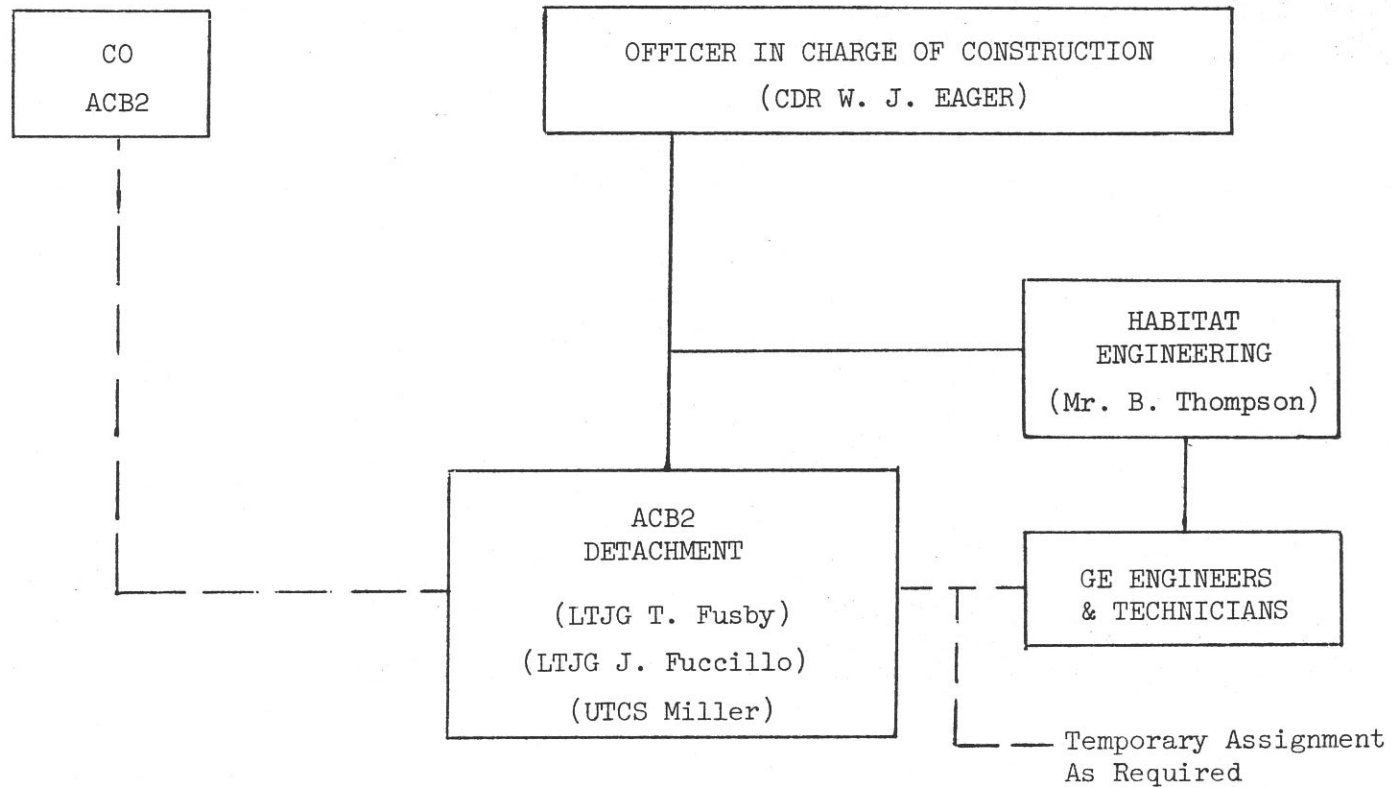
4. Public Relations Team: This team leader will be assigned by the Office of Naval Research. He will coordinate all Public Relations activities associated with the TEKTITE I Project. He will keep the Project Director fully informed of all planned public relations activities and obtain the Project Director's approval in advance of all media releases. He will coordinate inter-agency public relations activities for the various organizations within the project. He will make every attempt to insure that public relations activities do not interfere with operating personnel nor overtax the facilities of the base camp.

5. Scientific Coordination Team: This team leader will be assigned by the Office of Naval Research. He will coordinate the activities of all members of the scientific research team recommending priorities and changes to the Project Director through the Assistant Director for approval. He will keep the Project Director fully informed at all times on the progress of the scientific mission and of any anticipated problem areas.

ANNEX B

6. Medical Safety Team: This team leader shall be assigned by the Bureau of Medicine and Surgery. He shall be responsible to the Project Director for the medical safety aspects of the mission, as well as for the medical care of all personnel on-site, and will advise the Project Director of sanitary conditions within the base camp. He will assign medical personnel to the medical watch in the support center and to the base camp facilities, subject to approval of the Project Director. He will be responsible for medical equipment and supplies in the base camp dispensary and will advise the Project Director in event of serious illness or injury requiring possible evacuation. He will closely monitor the activities of the aquanauts ensuring that their activities are carried out in a manner consistent with safe operating procedures. He shall schedule, subject to approval of the Project Director, drills and exercises as necessary to ensure readiness of personnel to perform emergency procedures.

TEKTITE I
COMMAND STRUCTURE
FOR
CONSTRUCTION & WITHDRAWAL PHASES



PROJECT CONTEK

~~TEKTITE I~~

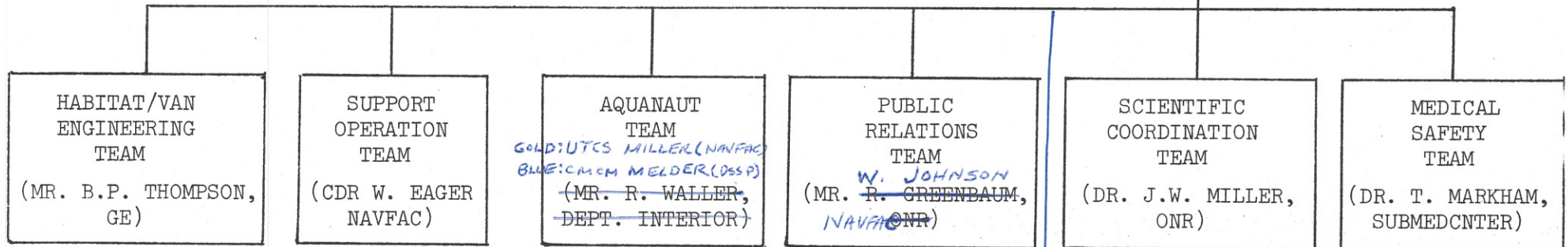
OPERATIONAL ORGANIZATION STRUCTURE

FOR

MAJOR EXPERIMENTAL PHASE

~~INTERAGENCY PROGRAM MANAGERS
(NASA, INTERIOR, NAVY,
GENERAL ELECTRIC)~~

PROJECT DIRECTOR FOR OPERATIONS
(~~CDR F. LOONEY, ONR~~) *CDR. W. EAGER CEC USN*
ASSISTANT PROJECT DIRECTOR (RESEARCH AND ENGINEERING)
(MR. D. PAULI, ONR)



WATCH
ORGANIZATION

APPENDIX II TO ANNEX B

SEE
APPENDIX II TO ANNEX J

ANNEX C

ANNEX C

PROJECT SITE

C.1. General: The project site is in Greater Lameshur Bay, St. John, Virgin Islands. The site is in the Virgin Islands National Park; a use permit has been issued to the Office of Naval Research for TEKTITE I. Appendix I shows a general disposition of facilities at the site.

C.2. Description of Facilities

C.2.a. Habitat

(1) General

An elevation view of the habitat structure is shown in Appendix II. The habitat is seen to consist of two pressure hulls attached to a rigid base, connected by a pressurized crossover tunnel. The two cylinders are divided internally into two compartments each, as shown in Appendices II and III. Six hemispherical viewing ports and a cupola are provided for crew observation and safety monitoring purposes.

The atmospheric pressure inside the habitat is equalized to ambient water pressure. The entry trunk will normally be left open (Appendix III), providing an air/sea interface for diver entry and exit. The emergency hatch in the crew quarters normally will be secured.

During habitat emplacement all hatches are secured and the habitat pressurized to working depth. For this reason, and to insure safety to the aquanauts in the event of differential pressure

ANNEX C

buildup, the pressure hull is designed in accordance with the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code for Unfired Pressure Vessels.

The base of the habitat is designed to be placed directly on the leveled ocean bottom. When emplaced, the total negative buoyancy of the habitat of 20,000 pounds assures stability in any normal sea conditions at the site. Jetted anchors, to which the habitat is tied, constitute a redundant bottom moor for additional negative buoyancy in the event of unusual sea conditions.

The habitat environmental control system will provide a viable environment by appropriately regulating the atmospheric pressure, composition, temperature, and humidity. The environmental control system is described in detail in the following paragraphs.

(2) Air Supply, Pressure, and pO_2 Control

The habitat will be initially pressurized on the surface to the emplacement depth pressure by a nitrogen (N_2) fill, thereby achieving an initial nominal partial pressure of oxygen (pO_2) of 160 mm mercury (Hg). After emplacement and during operation, compressed air will be continually supplied to the habitat via an umbilical by redundant air compressors located at the Habitat Support Center (HSC).

Flow control valves on the HSC will be utilized to control the flow rate of the inlet air to the habitat in accordance with both the pO_2 and total pressure requirements. The pO_2 shall be maintained

ANNEX C

between 151 and 165 mm mercury so as to create a controlled atmosphere in which to conduct the mission biomedical studies. The established air flow rate of 30 SCFh (standard cubic feet per hour) will provide the required oxygen level to the habitat and will insure a habitat total pressure increase rate sufficient to maintain an equilibrium with the water pressure as the tide and/or barometric pressure rises. This insures against water level rise in the open ingress/egress trunk. Total tidal variations at the selected site are expected to be less than one foot. The total pressure within the habitat will be controlled by a differential pressure relief valve. This valve has ports for sensing both sea water pressure and habitat air pressure, and will maintain a constant differential pressure between these ports.

(3) CO₂ Scrubber

The carbon dioxide (CO₂) scrubber will remove CO₂ produced by the crew by chemical absorption with Baralyme. The system consists of two blowers (one redundant), a Baralyme canister and associated valves and piping. The blower provides forced circulation of the habitat air through the Baralyme, where CO₂ is absorbed. The processed air is then directed, in proportioned parts, to each of the four compartments. The Baralyme canister is designed to hold sufficient chemical for 12 hours of use, at which time it will require replenishment. While only one CO₂ canister housing is utilized on the system, there will be several canisters (which load into the housing) available for convenience in recharging and for redundancy.

ANNEX C

The total air flow through the CO₂ scrubber will be 40 cubic feet per minute (CFM). This is sufficient to hold the partial pressure carbon dioxide (pCO₂) to less than 8 mm Hg. Nominal pCO₂ would be about 2 mm Hg, with a fresh canister, and would rise to a maximum of 8 mm Hg within the 12-hour life of the canister.

(4) Thermal Control

The thermal control system will maintain the habitat air temperature by actively removing heat from the system and will control humidity by condensing excess moisture from the air. Four cabin heat exchangers will be utilized, essentially each serving one compartment (although within each pressure vessel the output of the two heat exchangers are connected so that more heat removal capacity can be obtained for the maximum heat load compartments, i.e., the engine room and the crew quarters). Connected to each heat exchanger are a blower for air circulation, a charcoal filter for odor removal and control, and an electrical reheater. Dehumidification will be accomplished by condensing water vapor on the coils, as it passes through the heat exchanger. Humidity will be maintained at 45% with a limit not exceeding 70% except in the wet room where the allowable upper limit may be as much as 100%.

(5) ECS - Emergency Control Systems

The ECS provides several systems for use during various emergency situations that may occur. These systems are: (a) surface

ANNEX C

emergency air supply system, (b) purge system, (c) self contained emergency air supply system, (d) built-in breathing (BIB) system, and (e) escape air bottles. These systems function as follows:

a. The surface emergency air supply system will be located on the Habitat Support Barge and consists of two 8,000 SCF 2,200 pounds per square inch (psi) compressed air tubes serving as backup to the support barge air compressors. In the event of compressor failure or power failure, compressed air would automatically be supplied from these bottles, in a normal manner, to the habitat for up to 24 hours.

b. The purge system has been designed to completely change 90% of the air within the habitat within 4 hours. The system utilizes a 125 CFM, 100 psi engine-driven compressor and a nitrogen storage bank located on the support barge supplying gas to the habitat via the air supply umbilical. In operation, the habitat air would be purged until gas sampling indicated an acceptable atmosphere. Nitrogen would then be added to the system to reduce the pO_2 to within limits and the normal air flow system restored. The total nitrogen supply requirement will be met by four 8,000 SCF 2,200 psi nitrogen tubes which will provide nitrogen for initial pressurization, purge if required, and spares.

c. The self-contained emergency air supply system will consist of twenty-three 240 SCF compressed air cylinders located in

ANNEX C

the base of the habitat. This emergency air supply will be activated by the crew in the event of failure of air supply from the surface and is adequate to supply air for 72 hours to the habitat. The scuba charging system is interconnected with this emergency supply and may be used to supplement it.

d. The BIB system provides 12 breathing stations within the habitat used in the event of atmospheric contamination. The self-contained emergency air supply system can alternately supply air to the BIB system. In this mode the emergency air supply has a 12-hour endurance. The line pressure to these stations will be regulated to 100 psi. A demand regulator/hose assembly and face masks will be attached to each station. Of the 12 breathing stations provided, 4 will be in the crew quarters, 4 in the wet room, 2 in the bridge, and 2 in the equipment room. Hoses will be long enough to reach to the adjacent compartments.

e. Escape air bottles with regulators, hoses, and mouthpieces will be located in each compartment, except the wet room (where scuba tanks serve the same purpose). These bottles provide the capability to move about the habitat while under emergency conditions requiring use of the BIB system, and to escape from the habitat to the personnel transfer capsule (PTC). Each bottle contains 18 SCF of compressed air, which provides a useful life of 6 to 7 minutes. Of the 8 bottles to be provided, 4 will be in the crew quarters, 2 in the bridge, and 2 in the equipment room.

ANNEX C

(6) Atmosphere Monitoring System

The habitat system atmospheric monitoring equipment and the parameters and parameter limits to be monitored, are shown in Appendix IV.

(7) Communication System

A communication system will provide aural and visual communication within the habitat and between the habitat and the Surface Control Center. The system will also provide for audio contact between the habitat and the habitat divers.

The electrical system transmits power from redendant surface supply generators on the Habitat Support Barge, transforms it to meet the habitat equipment requirements and distributes it internally to the given loads. Surface power is automatically shut off (by a sensor in the habitat) in the event of major habitat flooding. Transformers are designed to prevent atmospheric contamination in the event of overheating. Requisite emergency power and lighting is supplied.

The plumbing and sanitary system transmits fresh, potable water from the surface supply on the Habitat Support Barge, provides personal hygiene facilities and a drain hose for waste disposal.

A first aid kit, designed by the senior medical officer, will be placed in the habitat.

(8) Alarm System

The alarm mechanisms used to monitor the habitat life support systems, and the displays presented by these alarm systems, are summarized in Appendix V.

ANNEX C

C.2.b. Decompression System

(1) General

The decompression system consists of a deck decompression chamber (DDC) with its environmental support, a submersible decompression chamber (SDC) for diver transfer to the surface, and the support vessel on which the decompression chamber is mounted.

The DDC, SDC, and all supporting environmental and power systems will be furnished as an ADS IV Diving System by Ocean Systems, Incorporated. Also provided by Ocean Systems, Incorporated will be an on-scene technician for operation, training, and field maintenance associated with the ADS IV System. The ADS IV System is Navy-certified to a depth of 600 feet. The SDC, DDC and environmental support included in the ADS IV System are described as follows:

(a) Submersible Decompression Chamber (SDC): The SDC is a 6-foot diameter, pressure proof, helium-tight sphere designed to accommodate the 4-man TEKTITE crew should an emergency condition exist. Fifteen viewports provide 360° visibility in the horizontal plane and approximately 320° visibility in the vertical plane.

(b) Deck Decompression Chamber (DDC): The DDC is a single-cylinder, double-lock decompression chamber. The overall length is 15 feet, and inside diameter is 53 inches. Each lock is designed to support 2 divers, although all divers can be sustained in the inner lock while the outer lock is used for lock-in/lock-out. The DDC

ANNEX C

has a total of 8 viewports. The DDC gas system furnishes breathing gas (in this case, air). Special breathing gas may be supplied through a mask/regulator breathing system. The planned decompression mode will be ventilation, so the CO₂ scrubber and external life support provided will not be required.

(c) Environmental Support: Environmental support and control is provided by an ADS IV Control Console Van (CCV). Gas system regulation for the SDC and the two DDC locks, gas sample analysis, and electrical power distribution are functions maintained by the CCV.

The decompression system described above will be mounted aboard a 90-foot by 20-foot crane barge. Also aboard the barge is a 35-ton capacity crane for handling the SDC. The decompression facilities aboard the barge are completely self contained and mobile.

Personnel for operation of the decompression facility, handling crane, and any necessary boat movement will be on a 24-hour alert watch.

C.2.c. Habitat Support Center

The Habitat Support Center is a barge located in Beehive Cove at the nearest shore point adjacent to the habitat location. The barge is a Navy AMMI pontoon jacked up above the water surface (for noise reduction) on driven piles. The barge is the shore terminus for all habitat umbilicals and provides the platform on which are mounted the Surface Control Center and all habitat support equipment. The habitat

ANNEX C

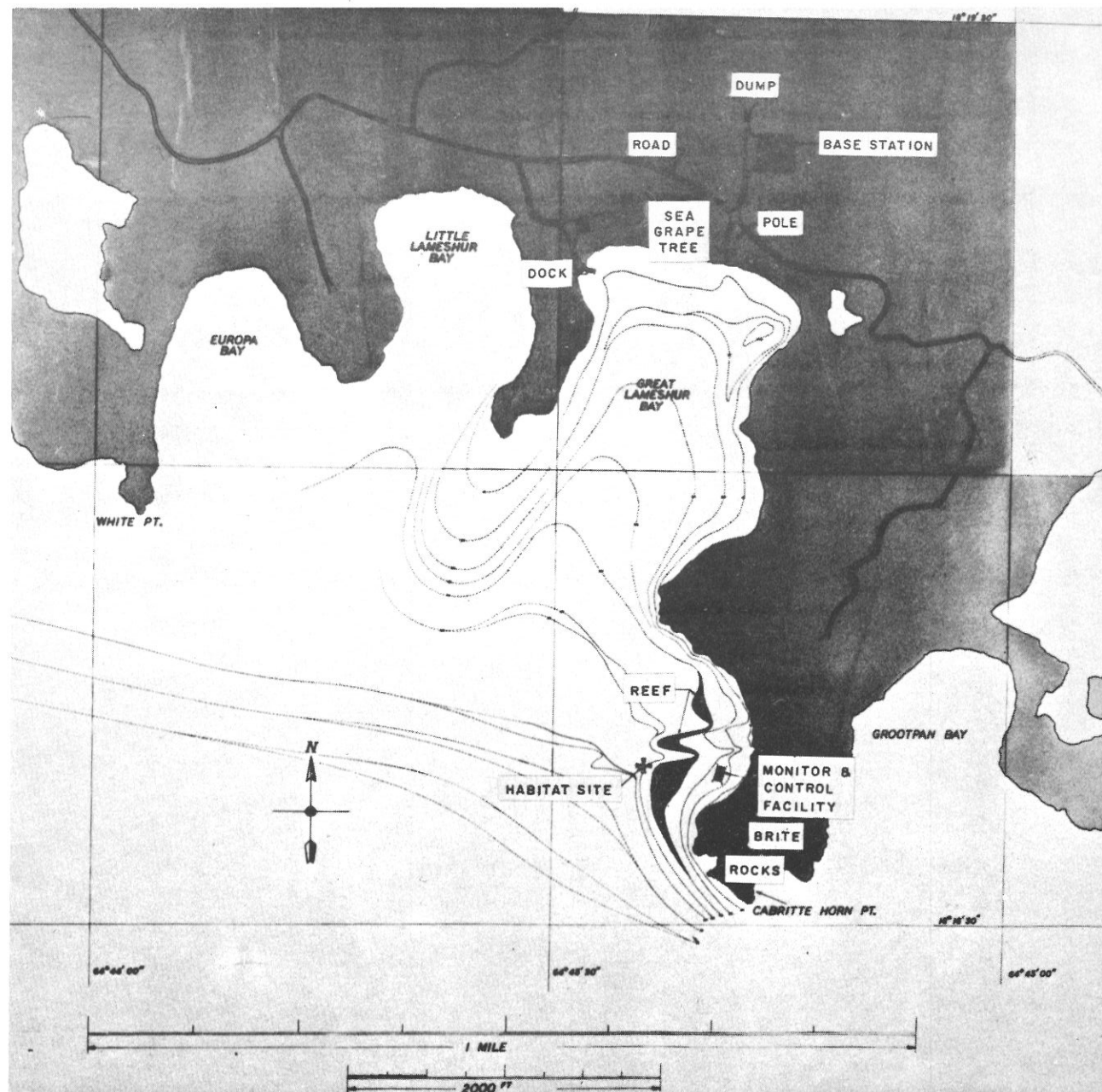
support equipment includes:

- Water storage tanks, pumps, and plumbing
- Environmental Control Console
- Environmental Control System
- Electrical generation and distribution equipment

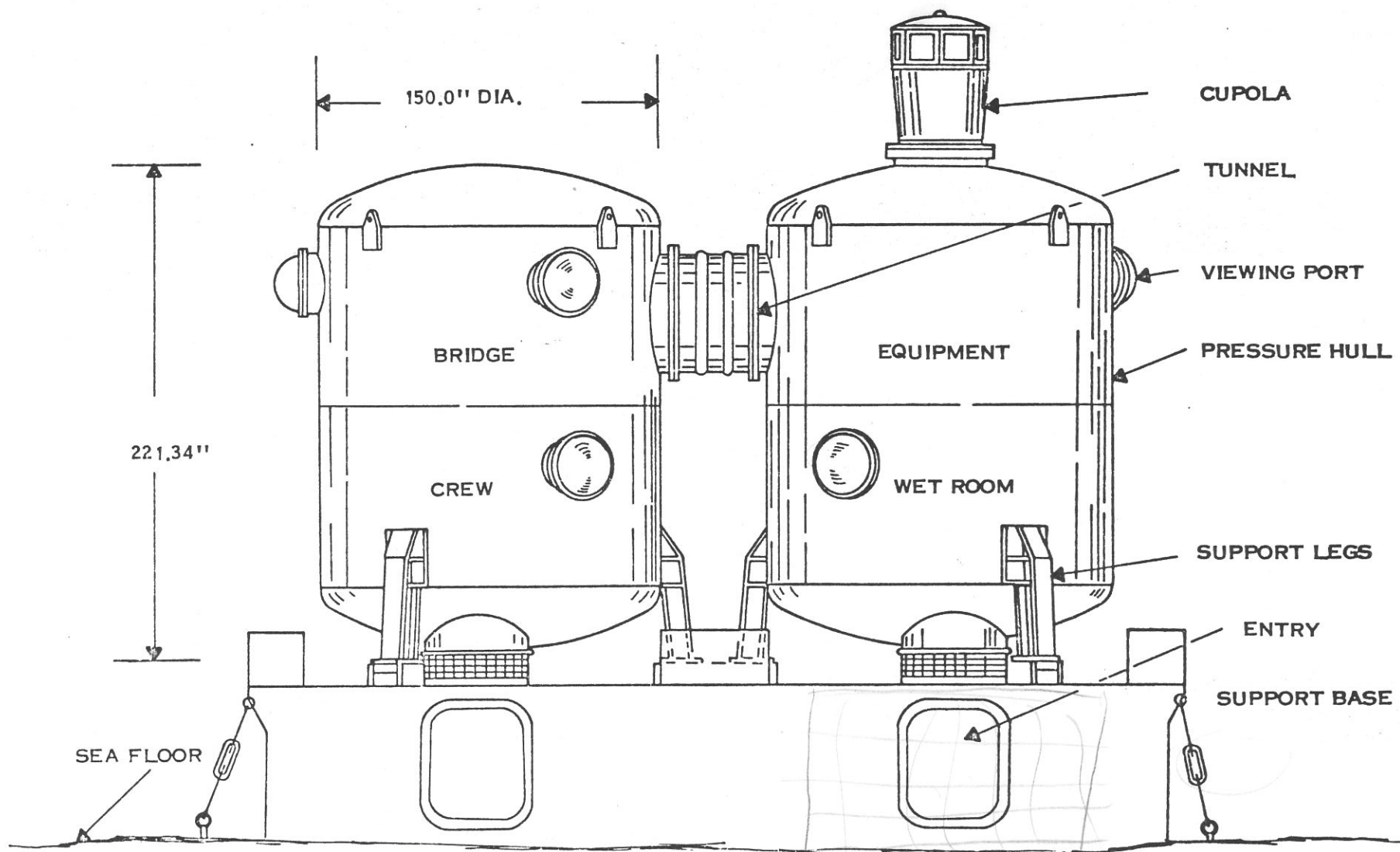
The Surface Control Center is in an Instrumentation Van divided into compartments designated as the Behavioral Monitoring Station and the Watch Director's Station. The Behavioral Monitoring Station will accommodate up to 4 persons and will contain 6 video receivers displaying outputs of the 4 internal and 2 external habitat cameras. Audio monitoring of the habitat open microphones and sound powered phones can be recorded on 2 audio recorders. The Watch Director's Station will provide audio, video, and environmental monitoring capability for the Watch Director and the Medical Watch Officer. The habitat alarm system will be displayed at the Watch Director's Station, which also serves as the connecting link for all communications to the habitat, base camp, mainland, and immediate surface area.

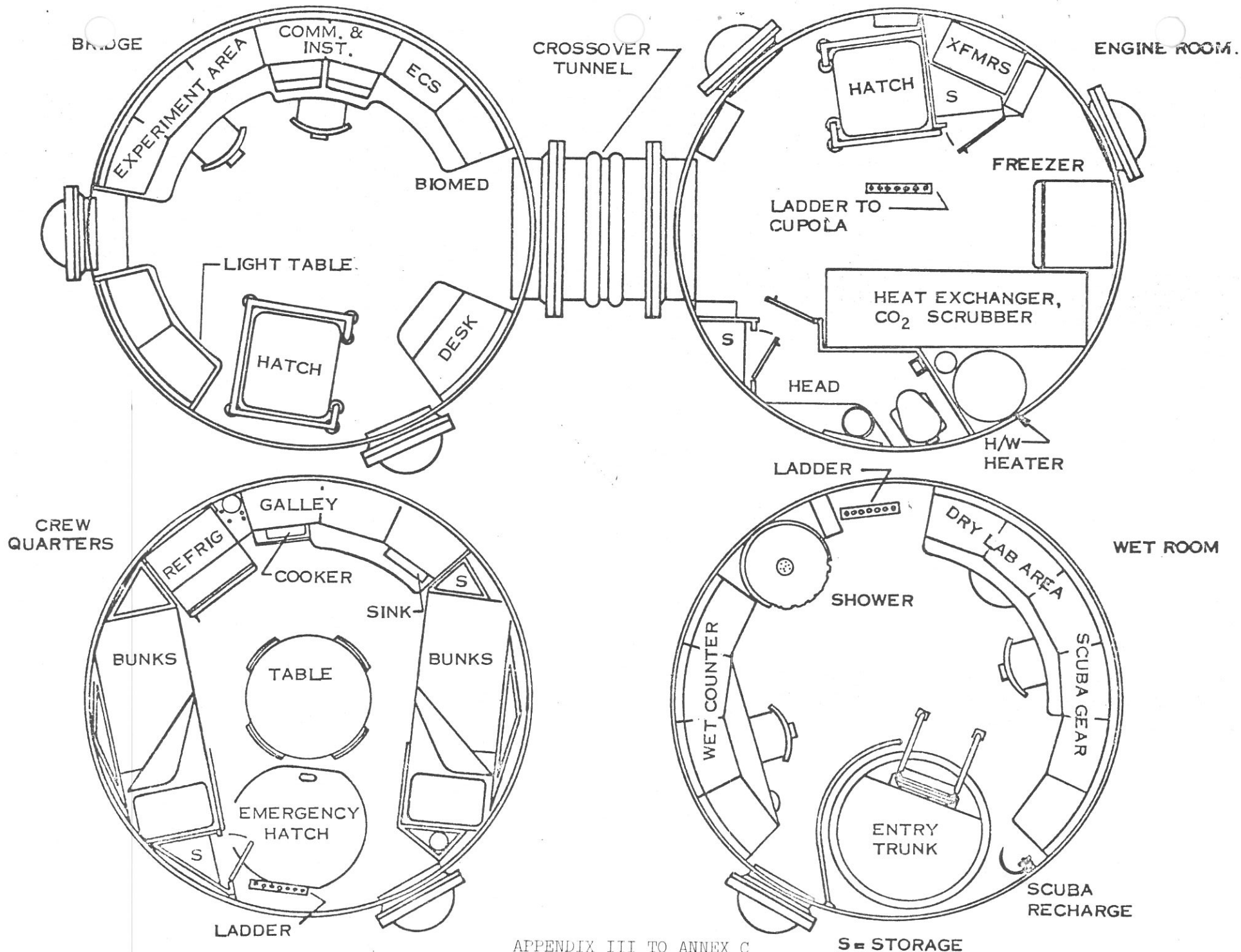
C.2.d. Base Camp

The base camp is a semi-permanent facility to house and mess about 110 personnel, located at the northern end of Greater Lameshur Bay. (See Appendix I).



APPENDIX I TO ANNEX C





<u>CONSTITUENT</u>	<u>EQUIPMENT MONITORING RANGE</u>	<u>ACCEPTABLE OPERATING RANGE</u>	<u>EQUIPMENT</u>	
			<u>HABITAT</u>	<u>SURFACE</u>
O ₂ - pp	0 - 450 mm hg	151 - 165 mm hg	Mass Spectrometer	Beckman
CO ₂ - pp	0 - 15 mm hg	0 - 8 mm hg	" "	Gas Chromatograph
H ₂ O	0 - 100% rel	30 - 70% rel	" "	" "
N ₂ - pp	0 - 2000 mm hg	1570 - 1600 mm hg	" "	" "
CO -	10 - 3000 ppm	0 - 15 ppm	Detector Tube	Gas Chromatograph
Hydrocarbons	1 - 5X acceptable	See Spec TEK 17-5001	" "	" "
Particulates	0 - 100 mg/m ³	5 - 25 mg/m ³	Air Sampler	-----
Freon 12 and 22	0 - 2000 ppm	0 - 1500 ppm	Detector Tube	Gas Chromatograph
<u>Back-up Equipment</u>				
O ₂			MSA - O ₂ Meter	Gas Chromatograph
CO ₂			Detector Tubes	O ₂ Sat
H ₂ O			Rel. Hum. Gage	---
N ₂			Press. Gage	---
CO			None	Detector Tube
Hydrocarbons			None	Sample to P. R.
Particulates			None	None
Freon			None	Detector Tube

ATMOSPHERE MONITORING PARAMETER & EQUIPMENT

APPENDIX IV TO ANNEX C

	HABITAT-BRIDGE		SURFACE CONTROL CENTER	
	VISUAL	AUDIBLE	VISUAL	AUDIBLE
CO ₂ Partial Pressure	Meter/Alarm Light	Buzzer	Meter	--
O ₂ Partial Pressure	Meter/Alarm Light	Buzzer	Meter	--
N ₂ Partial Pressure	Meter	--	Meter	--
H ₂ O Partial Pressure	Meter	--	Meter	--
120V Power Loss	Alarm Light	Buzzer	TV	Speaker
Entry Trunk Water Level	Alarm Light	Buzzer	TV	Speaker
Wet Room Flooding	Alarm Light	Horn	TV	Horn

Notes:

- (1) "Wet Room Flooding" alarm automatically turns off power to habitat at shore end.
- (2) Buzzer may be manually activated in the bridge.
- (3) Habitat horn may be manually activated from the bridge only.
- (4) Habitat Control Center horn may be manually activated from the van only

TEKTITE ALARM SYSTEM

APPENDIX V TO ANNEX C

ANNEX D

ANNEX D

EXTERNAL RELATIONS

External contacts are herein construed to include all activities not directly involved with on-scene project functions, but which have a genuine interest in the status of operations. Such interest may evolve from peripheral participation in some support function, possible future involvement in emergency support, or from reasonable association with the project by virtue of other regional responsibilities. All such external relations shall be cleared through the Project Director or his designated representative.

D.1. Local Authorities: Virgin Islands Government - provides water barge services on a schedule basis as outlined in ANNEX F, plus public relations assistance.

D.2. Regional Authorities:

a. Commander, Caribbean Sea Frontier - Naval Area Commander

b. Commander, Tenth Naval District - Naval Shore Establishment Commander within this District of the Caribbean Area

c. U. S. Naval Station, San Juan, Puerto Rico - provides communications support as outlined in ANNEX E and additional logistics support as outlined in ANNEX F.

d. U. S. Naval Station, Roosevelt Roads, Puerto Rico - provide supply and logistics support as outlined in ANNEX F

e. U. S. Coast Guard Station, St. Thomas, V.I. - communications support as noted in ANNEX E

D.3. Type and Fleet Commands

a. COMNAVAIRLANT - provides 24 hour weather forecasts via FWF

ANNEX D

Jacksonville or Roosevelt Roads Detachment

- b. CINCLANTFLT - Authorizes support of PHIBLANT and SERVLANT (CNO Message 162214Z Oct 68 refers)
- c. COMPHIBLANT - authorizes support of CBLANT and provides small craft for project use
- d. COMSERVLANT - authorizes support of surface units for transportation and logistics
- e. COMCBLANT - authorizes support of CB Detachment from ACB 2
- f. Supervisor of Salvage - provides standby search and rescue vessel support (if it is required), plus contract services of decompression system (ADS MK4)

D.4. Press and Public Information

D.4.a. General

The TEKTITE Public Information program will be a coordinated inter-agency effort under the direction of the Office of Naval Research, which is providing the technical direction for the overall TEKTITE program. Mr. R. S. Greenbaum, Head, ONR Public Affairs Branch is the public relations team leader and will act as TEKTITE Information Coordinator: he will have the prime responsibility for all public information matters. All material released to news media will be in the name of the TEKTITE program. Each Information Officer participating in the program will regard himself as a TEKTITE Information Officer and not primarily as a representative of his organization. He will avoid promoting the contribution of his own organization and at all times alert news media to the identity of all of the sponsoring

ANNEX D

activities -- the Navy, Interior, NASA and General Electric. All formal news announcements to news media will be issued on special TEKTITE letterhead stationery.

D.4.b. TEKTITE Information Center Quarters

General Electric has agreed to provide rented quarters to be used as the TEKTITE Information Center in the Virgin Islands. These quarters, known as the Berger House, will also be used as a VIP Reception Center. Berger House is located on the east end of St. Thomas north of Red Hook Bay, where boat transportation will be available to the St. John operating site. The house is about a ten minute drive from Red Hook and about a thirty five minute drive from Charlotte Amalie and the St. Thomas airport. The house, which contains seven bedrooms, will also be used as living quarters for TEKTITE Information Officers and provide sleeping accommodations on a short-term basis for VIP's, news media and TEKTITE personnel requiring overnight accommodations. GE has established a nominal charge to be paid to GE by all non-GE personnel, including Information Officers, staying overnight. The Information Center will be equipped with typewriters, Xerox machine, movie projector for screening film, video tape player, Telex machine for direct communications with the mainland, and telephone. GE will provide a secretary to be hired locally, who will serve the Information Center and also perform clerical duties for GE.

ANNEX D

D.4.c. Staffing of Information Center

The TEKTITE Information Center will be staffed by a minimum of two Information Officers at all times. Mr. Anthony M. Sinopoli of the ONR Public Affairs staff will be assigned to the TEKTITE Public Information Program during the entire period of the operation, beginning about 27 January. Additional Information Officers will be provided by the participating organizations on a scheduled basis. Each organization should assign its representative for a minimum period of two weeks. During key periods, particularly at the start and conclusion of the operation, it is anticipated that all organizations will have at least one Information Officer on hand to handle the increased number of news media expected to be present.

D.4.d. Procedures for the Release of News

All news releases will be approved by Mr. Greenbaum or his authorized representative. Authorized sources for information on the TEKTITE program will be: CDR Frank Looney, Project Director, Mr. Denzil Pauli, Assistant Director, Dr. James W. Miller, Scientific Coordination Team Leader, all representing ONR; Mr. Richard Waller, Aquanaut Team Leader, representing Department of the Interior; Mr. Brenden Thompson, Habitat/Van Engineering Team Leader, representing General Electric; and Mr. Eugene Burcher, representing NASA; or other officials designated by them. Based on information received from one or more of these sources, news will be released verbally to news media at the Information Center or those calling the Center for information. Using this information, the Information Center will also

ANNEX D

prepare a daily progress report, summarizing each day's highlights. The report will also be mailed daily to the home public information offices of each participating organization via overseas air mail, where it will be made available to news media on request. A TEKTITE Information Officer will visit the base camp every day, seven days a week, to obtain the information for the daily report. The TEKTITE Information Coordinator or his representative will remain at the base camp as necessary to be completely familiar with the TEKTITE operation. Special news announcements on key points in the operation will be formally prepared and reviewed by the TEKTITE Information Coordinator, duplicated on TEKTITE letterhead paper by General Electric, Valley Forge, Pa., and mailed out to a consolidated master press mailing list. Special feature stories on unusual aspects of the operation will be prepared and distributed in the same manner, although some of these may be distributed to a specialized news media group. It should be noted that news media will not be permitted to communicate directly with the aquanauts after the start of the operation.

D.4.e. Photography

Prior to 15 February, official photography, including underwater photography, will be primarily taken by a Navy combat camera crew and professional photographers hired by GE and Interior. The Navy film will be used mainly for documentary purposes and will be processed commercially so that it can be made quickly available for release to news media. Beginning 15 February, the start of the operation, all underwater photography will be shot by the aquanauts and periodically released to the surface for processing.

ANNEX D

All still photographs will be reviewed jointly by a TEKTITE official and a TEKTITE Information Officer, prior to release, and a selection made based on the quality and significance of the photographs. Single copies of selected photographs will be mailed to the home public affairs offices of the participating organizations where they can be reproduced in quantity by the individual offices and distributed to news media on request. Approximately once a week the best black-and-white photo will be reproduced in quantity by GE and distributed to news media using the master mailing list. A master file of color slides will also be kept at the Information Center and, if possible, selected copies will be sent to home public affairs offices. A work print of all motion picture film taken by the GE and Interior photographers and the aquanauts will be sent to the Information Center, where it will be reviewed jointly by a TEKTITE official and an Information Officer; appropriate segments will be selected for release to television (using edge numbers as references). GE will distribute prints of the selected footage to television networks with a copy to the Information Center where it will be used for briefing VIP's and news media. In addition, a duplicate master of the selected footage will be sent to the Office of TEKTITE Information Coordinator, Washington, D. C., where it will be kept on file and be available to make additional prints for distribution to local television stations.

News media representatives will be permitted (subject to the approval of the Project Director, and provided they are fully qualified scuba divers) to take underwater photography under carefully controlled

ANNEX D

conditions, between the date the habitat is in place and the date of the start of the operation. No underwater photography by anyone (except the TEKTITE aquanauts) will be permitted after the start of the operation. It is also planned to make available for release to television, selected segments of video tape of the aquanauts' activities.

D.4.f. Visits by News Media to Operation Site

All news media representatives will be escorted to the St. John operation site by an Information Officer. There will be a Navy boat and a GE boat available for transportation to St. John. Arrangements will be made in advance for interviews with TEKTITE officials and for visits to the operation site. News media representatives visiting the site can view live television of the aquanauts both inside the habitat and working on the outside and "eavesdrop" by means of open microphones in the habitat. Since no meals or food of any kind will be available to visitors, box lunches will have to be carried. News media representatives will not be permitted to stay overnight at the base camp and must return to St. Thomas at the end of the day.

D.4.g. Emergency Procedures

In the event of an accident involving serious injury or death, or an accident threatening serious injury or death, the TEKTITE Information Coordinator will notify immediately appropriate officials in all the participating organizations. (If the Coordinator is on the scene at the time, he will notify an appropriate person in ONR, who will

ANNEX D

immediately pass the information to the other organizations.) As soon as reasonably accurate information, no matter how limited, has been obtained and only after next-of-kin has been notified through the injured person's parent organization, a simultaneous announcement will be made to news media from the Information Center in St. Thomas and from Washington (via the Pentagon Press Corps) for immediate distribution.

(Note: Special contingency releases will be prepared in advance.)

D.4.h. Key Contact Points

Mr. R. S. Greenbaum, the TEKTITE Information Coordinator, or his designated representative, will always be available for contact in Washington. Office telephone numbers are as follows: Area Code 202-0Xford 6-4690/6-6092 or 767-2282/2087. (Mr. Greenbaum's home telephone is Area Code 301-585-4168.) The telephone number for the TEKTITE Information Center (Berger House) in St. Thomas is Area Code 809-774-6370. If telephone contact cannot be made with the Information Center, and an urgent matter is involved, a call for assistance can be made to Mr. Howard Farber, Public Relations Officer in the Office of the Governor, Virgin Islands: Area Code 809-774-0294.

ANNEX E

ANNEX E
COMMUNICATIONS

E.1. Telephone Communications

All telephone communications will be via commercial telephone.

The working numbers are as follows:

- | | |
|---|--------------|
| 1. Base Camp | 809-774* |
| 2. Red Hook Pier | 809-774-9618 |
| 3. Coast Guard Station | 809-774-* |
| 4. Public Information
"Berger House" | 809-774-6370 |

*Not presently available.

E.2. Radio Communications

All radio communications will be under the control of the Project Director for Operations. Persons operating local, island, and any other nets will observe good operating practices.

E.2.a. Local communications will be via hand-held PT200 units. These units are primarily intended for use between boat, crane, and diving watches, and between the base camp and surface support center.

E.2.b. Island communications between Lameshur Bay and St. Thomas and Puerto Rico will be via AN/PRC-47 100 watt SSB units. The principal established island net frequencies are:

- (a) 2112.5 KHZ: NORATS and Coast Guard Station, St. Thomas
- (b) 2150 KHZ: Naval Station Roosevelt Roads Tug Control
- (c) 2182 KHZ: International Distress and Calling Frequency.

These AN/PRC-47 units will be located:

- (a) Surface Support Center
- (b) Base Camp
- (c) Coast Guard Station
- (d) Primary Personnel Transport Boat
- (e) National Park Service Headquarters.

ANNEX E

E.2.c. Radio communication between Lameshur Bay and Washington, D.C., will be via SSB (USB) on the frequency 16401.5 KHZ. Such communications will be on a regularly scheduled daily basis; however, this frequency will be monitored in Washington during normal working hours (1300-2130Z Monday through Friday).

E.2.d. Message Communications

All message communications to the site will be sent to the Coast Guard Station, St. Thomas, with the notation "Pass to TEKTITE I Project Director."

ANNEX F

ANNEX F
LOGISTICS

F.1. Supplies

F.1.a. Provisions

1. Frozen: Amphibious Construction Battalion Two will bring sufficient frozen food to support the operation until the first week in April. Selected naval ships are due for a port visit in St. Thomas in mid-February. A replenishment of frozen supplies is possible from their ships, and will extend the frozen food endurance to the first week in May.

2. Dry: Amphibious Construction Battalion Two will bring aboard the USS HERMITAGE sufficient dry provisions to last for the duration of TEKTITE. Supplementary dry provisions may be obtained as described in paragraph F.1.a.1. above.

3. Fresh: Amphibious Construction Battalion Two will purchase fresh provisions on the St. Thomas local economy, to be delivered to Red Hook Pier by the local Navy Contractors. The primary Navy contractor

is:

S.A.L. Company
P. O. Box 750
St. Thomas, Virgin Islands 00801
809-774-3421

F.1.b. POL Products

1. Marine Diesel and Automotive Gasoline (MOGAS): Marine Diesel Fuel and MOGAS are supplied under Region Two Contract Bulletin contracts administered by the Defense Fuel Supply Agency, Cameron Station, Alexandria, Virginia. Suppliers and contract numbers are as follows:

ANNEX F

- a. Diesel: ESSO Company, St. Thomas
DSA Contract No. 600-69-D-0726
- b. MOGAS: Asiatic Div., Shell Oil Company
DSA Contract No. 600-69-D-0714

Both products are delivered via contractor tank-wagon into Navy-furnished drums at the Navy Submarine Dock, St. Thomas. Naval Station, San Juan, is the ordering and paying office for both contracts. The fuel will be transported from St. Thomas to Lameshur Bay aboard a Virgin Islands water barge.

2. Boat Diesel: Boat fuel will be purchased when required at Red Hook, St. Thomas, using an Amphibious Construction Battalion Two credit card.

3. White Gasoline (Cooking): Available on local purchase at St. Thomas from TEXACO. Regular grade automotive gasoline for any vehicle on St. Thomas will be purchased by credit card.

3. Lube Oil: Amphibious Construction Battalion Two will bring sufficient lubrication oil aboard the USS HERMITAGE to last for the duration of Project TEKITE. Emergency lube oil may be obtained by local purchase or from Naval Station, Roosevelt Roads.

F.l.c. Water

Water will be delivered on a weekly basis from St. Thomas via Virgin Island government water barge. Variations in schedule may be made through the Office of the Virgin Islands Commission of Public Works.

ANNEX F

F.1.d. General Store

1. Organizational Stores: Amphibious Construction Battalion

Two will carry aboard the USS HERMITAGE sufficient quantities of organizational stores (cleaning gear, galley supplies, toilet and cleaning paper, etc.) to last for the duration of TEKTITE I. Other requirements can be accommodated by one of the following methods:

(1) Water barge from Roosevelt Roads, (2) visiting ships to St. Thomas, (3) available flights, and (4) local purchase.

2. Personal Items: Toilet articles (shaving cream, razor blades, etc.) will be procured on a personal basis at St. Thomas. Personnel are encouraged to take sufficient supply to last as long as feasible.

F.2. Transportation

F.2.a. Available Boats/and Vehicles: The following Navy boats and vehicles will provide primary transportation for TEKTITE personnel:

LCM	2 ea	Lameshur Bay
LCPL	2 ea	Lameshur Bay
7-man rubber boat w/ motor	3 ea	Lameshur Bay
Jeeps	2 ea	Base Camp, St. John
Truck	As Required	Base Camp, St. John
4x4 Ordnance Carrier	1	St. Thomas.

Any additional craft in Lameshur Bay will be either work boats or private boats. All boats at the site, Navy or private, will be under the control of the Project Director for Operations. Maintenance of Naval boats will be a responsibility of the Support team.

ANNEX F

F.2.b. Transportation Modes: The following transportation modes will be available to TEKTITE personnel. These modes may be varied or supplemented as the situation requires.

1. Lameshur Bay Movement

Movement of personnel within Lameshur Bay will be by powered rubber boat whenever possible. This includes travel between the base camp and support barge, movement of support divers, and movement while monitoring aquanaut activities. Travel by larger craft within Lameshur Bay will be minimized for noise control.

2. Between St. Thomas or Puerto Rico and Mainland U.S.A.

All scheduled travel between St. Thomas and Puerto Rico/Mainland U.S. will be by commercial carrier. All persons incoming to St. John should arrange for commercial taxi transportation from the St. Thomas airport to Red Hook pier in time for small boats. Any special arrangement requests should be made by telephone directly to the base camp or through the St. Thomas Coast Guard Station.

3. Boat schedules will be promulgated at the discretion of the Project Director to provide optimum service; a preliminary schedule is included in "Base Camp Routine/Regulations" (APPENDIX I TO ANNEX J).

ANNEX G

ANNEX G

SAFETY

G.1. General

G.1.a. Scope: Safety of the habitat crew and all support personnel shall receive top priority during all phases of planning and operations. Project safety as a whole will be considered to consist of two elements: (a) safety of the aquanauts, (b) safety of surface support personnel.

The emphasis of the Safety Annex is upon the safety of the habitat crew.

G.1.b. Reference: Reference (in general, and by specific section and page numbers) for this Safety Annex is made to the General Electric Company document TEK-OP-103 Rev. 2, entitled "TEKTITE I Safety and Medical Program Plan, Revision 2, January 17, 1969." This document has been reviewed and approved for incorporation into the overall TEKTITE I planning documentation by all appropriate medical safety, engineering, and technical personnel of TEKTITE I. Copies of this Safety Plan will be distributed as follows:

HABITAT	(3 copies)
WATCH DIRECTOR'S POST	(2 copies)
DECOMPRESSION STATION	(2 copies)
SUPPORT DIVERS' POST	(1 copy)
BASE CAMP	(1 copy)
PUBLIC AFFAIRS POST	(1 copy)

In addition, the Project Director, Assistant Project Director (Research and Engineering), and all Team Leaders will be provided personal copies of the above-referenced document.

ANNEX G

G.2. Habitat/System Safety Elements

All elements of the habitat system (i.e., habitat, support barge, decompression barge) have been designed and fabricated using applicable standards, codes, and specifications as guides. A habitat design and material safety review has been conducted by the Naval Ship Systems Command (PMS 81). Those elements of the habitat system whose primary function is crew safety are summarized in Annex C.

G.3. Emergency Situations

Emergency situations which could jeopardize the safety of the habitat crew are addressed in the referenced Safety Plan (section and page number as indicated) and are summarized in the following subparagraphs. Emergency procedures to be followed and the extent of damage control to be exercised by the crew will be governed by the severity of the emergency condition.

G.3.a. Habitat Emergency Situations:

- (1) Loss of pressure; flooding (Section 4.2.1.2, page 27)
- (2) Fire (Section 4.2.1.3, page 27)
- (3) Atmospheric contamination (Section 4.2.1.4, page 28)
- (4) Equipment failure (Section 4.2.1.6, page 29)
- (5) Electrical power loss (Section 4.2.1.7, page 29)
- (6) Injury to crew member (Section 4.2.1.5, page 29)

G.3.b. External (Swimmer) Emergency:

- (1) Accidental surfacing (Section 5.2.1.1, page 35)
- (2) Dangerous animals (Section 5.2.1.2, page 36)
- (3) Loss of air (Section 5.2.1.3, page 36)
- (4) Lost diver (Section 5.2.1.4, page 37)
- (5) Injured diver (Section 5.2.1.5, page 37)
- (6) Decompression sickness under pressure (Section 5.2.1.6, page 37)

ANNEX G

G.3.c. Surface Emergency:

- (1) Foul weather (Section 4.2.2.1, page 30) also (Appendix III to ANNEX J of this TEKTITE I Operational Plan)
- (2) Injured man (Section 4.2.2.2, page 31)
- (3) Fire; explosion (Section 4.2.2.3, page 31)
- (4) Equipment failure (Section 4.2.2.4, page 31)

G.4. Safety Procedures

G.4.a. Normal Procedures

Normal safety procedures for routine mission operations are summarized in the following sub-paragraphs. Routine mission operations include activities of (a) aquanaut crew within or outside of the habitat, (b) surface personnel manning the habitat support facilities, (c) any other activity by on-site personnel. These procedures are addressed in the Safety Plan referenced in Article G.1.b.

(1) Habitat (Aquanaut) Procedures:

- (a) Evaluation of Condition of Crew (Section 4.1.1.1, page 19)
- (b) Monitoring Operational Status of Crew Members (Section 4.1.1.2, page 21)
- (c) Monitoring Environment and Equipment Operation (Section 4.1.1.3, page 21)
- (d) Communication of Safety Status, Safety Command, and Scientific Information (Section 4.1.1.4, page 22)

(2) Aquanaut Diving Safety Procedures:

- (a) Aquanaut Equipment Required (Section 5.1.1.a, page 32)
- (b) Aquanaut Egress and Regress Procedures (Section 5.1.1.b, page 32, and Section 5.1.1.f, page 34)
- (c) Aquanaut Solo Diving (Section 5.1.1.c., page 33)
- (d) Aquanaut Communications (Section 5.1.1.d, page 33)
- (e) Aquanaut Navigation (Section 5.1.1.e, page 33)
- (f) Aquanaut Horizontal and Vertical Excursion Limits (Section 5.1.1.g, page 34)

ANNEX G

(3) Surface Support Safety Procedures:

- (a) Mission Operations Coordination (Section 4.1.2.1, page 24, and ANNEX B, TEKTITE I Operations Plan)
- (b) Medical (Aquanaut) (Section 4.1.2.2., page 34)
- (c) Support and Safety Divers (Section 5.2.2, page 38)
- (d) Monitoring Environment and Equipment (Section 4.1.2.3, page 24)
- (e) Communications (Section 4.1.2.4, page 25)
- (f) Routine Inspections and Maintenance (Section 4.1.2.5, page 25)
- (g) Medical (Surface Personnel) (Section 6, page 38)

(4) Decompression:

- (a) Aquanauts: Normal (and emergency) decompression procedures for the aquanauts will be in accordance with the established schedule. (Section 5.3.1, page 38) (these schedules are herein included as Appendices I and II to ANNEX G)
- (b) Support and Safety Divers: Decompression procedures will be as prescribed by the U.S. Navy Diving Manual.

G.4.b. Emergency Conditions

Emergency procedures will be initiated immediately upon determination that an emergency situation exists, and the Watch Director and Project Director will be notified immediately. In the event of an emergency, three Conditions are recognized, and the appropriate Emergency Condition will be set by the Watch Director:

- | | |
|---------------|--|
| CONDITION III | Aquanauts will remain in the habitat and carry out corrective or damage control action |
| CONDITION II | Aquanauts will temporarily evacuate the habitat until the habitat has been deemed safe for return; this decision will be made by the Project Director/Aquanaut Team Leader |
| CONDITION I | Aquanauts will abandon the habitat in an abort-mission situation |

ANNEX G

Any of these Conditions may result from any one of the emergency situations addressed in ANNEX G, Section G.3. Crew actions under each Condition will depend largely on the emergency situation, but basically shall consist of the following:

CONDITION III (Crew remains in habitat):

(1) Aquanaut Team Leader will designate one team member to man the habitat bridge communication post to provide an orderly flow of information topside.

(2) Aquanaut Team Leader will designate the team member(s) to undertake damage control action.

(3) Appropriate ECS Emergency Systems (ANNEX C, Section C.2.a.(5)) will be utilized.

CONDITION II (Crew evacuates habitat):

(1) Aquanaut Team Leader will insure that all team members evacuate the habitat in a safe, expeditious manner.

(2) Aquanaut Team Leader will designate the team member(s) to man available underwater communication modes.

(3) Aquanaut Team Leader, when directed by the Project Director, will designate the team member(s) to assist in damage control.

(4) Appropriate ECS Emergency Systems (ANNEX C, Section C.2.a.(5)) will be utilized.

ANNEX G

CONDITION I (Crew abandons habitat):

- (1) Aquanaut Team Leader will insure that all team members evacuate the habitat in a safe, expeditious manner.
- (2) Aquanaut Team Leader will designate the team member(s) to man available underwater communication modes.
- (3) Aquanaut Team Leader will, when directed by the Project Director, designate team member(s) to assist where possible in the decompression process.
- (4) Appropriate ECS Emergency Systems (ANNEX C, Section C.2.a.(5)).

G.5. Emergency Assistance

For emergency situations which cannot be handled with local project facilities, assistance will be requested from appropriate sources, and the Chief of Naval Research and other appropriate authorities will be immediately notified.

APPENDIX I

NORMAL DECOMPRESSION SCHEDULE FOR TEKTITE I

1. Aquanauts will be transferred via the Personnel Transfer Capsule to the Deck Decompression Chamber and held at a depth of 42 feet until all are transferred and topside crew is ready for decompression.
2. All depth changes during the decompression will be made at a rate of 1 foot per minute. In the event the depth changes occur slower the time will be added onto total decompression.

<u>DEPTH</u>	<u>TIME AT STOP (Minutes)</u>	<u>TOTAL DECOMPRESSION TIME (Minutes)</u>	<u>BREATHING MEDIA</u>
42 ft.			
↓	12	12	Air
30	120	132	Air
↓	5	137	Air
25	200	337	Air
↓	5	342	Air
20	170	512	Air
20	30	542	Oxygen
↓	5	547	Oxygen
15	20	567	Air
15	30	597	Oxygen
15	20	617	Air
15	30	647	Oxygen
15	20	667	Air
15	30	697	Oxygen
15	20	717	Air
15	30	747	Oxygen
↓	5	752	Oxygen
10	60	812	Air
10	30	842	Oxygen
10	20	862	Air
10	30	892	Oxygen
10	20	912	Air
10	40	952	Oxygen
↓	5	957	Oxygen
5	200	1157	Air
	5	1162	Air
Surface			

Total decompression time is 1162 minutes or 19 hours 22 minutes.

Total oxygen decompression time is 265 minutes or 4 hours 25 minutes.

APPENDIX II

TEKTITE I EMERGENCY DECOMPRESSION SCHEDULE

<u>DEPTH</u>	<u>TIME</u>	<u>TOTAL DECOMPRESSION TIME</u>	<u>BREATHING MEDIA</u>
60	20	20	O ₂
↓	5	25	O ₂
55	20	45	Air
↓	5	50	Air
50	20	70	O ₂
↓	5	75	O ₂
45	20	95	Air
↓	5	100	Air
40	20	120	O ₂
↓	15	135	Air
25	60	195	Air
↓	5	200	Air
20	90	290	Air
20	30	320	O ₂
↓	5	325	O ₂
15	90	415	Air
15	60	475	O ₂
↓	5	480	Air
10	120	600	Air
10	60	660	O ₂
↓	5	665	O ₂
5	150	815	Air
5	60	875	O ₂
↓	5	880	Air
Surface			

Total decompression time is 880 minutes or 14 hours 40 minutes.

Total oxygen decompression time is 4 hours 50 minutes.

ANNEX H

ANNEX H

OPERATION PLAN

The total TEKTITE project covers five distinct phases over about a two year period; each phase operated under a detailed plan which is separate and distinct from each other phase.

H.1. Program Definition; Equipment Design and Fabrication; Procurement, Assembly and Checkout: This is PHASE I of the overall plan which began in January 1968 and was completed on 8 January 1969.

H.2. Facility Establishment On-Site and Equipment Installation and Checkout: This is PHASE II of the overall plan which is scheduled for completion not later than 10 February 1969. A detailed plan of operations for this phase has been issued separately, and has been distributed to those elements concerned with this phase.

H.2.a. Loadout of Equipment and Habitat from Philadelphia Naval Shipyard: Completed.

H.2.b. Establishment of Base Camp Facilities: Completed.

H.2.c. Transportation and Delivery of Equipment and Habitat to Site: Completed about 15 January 1969 by USS HERMITAGE.

H.2.d. Installation and Checkout of Equipment and Habitat: To be completed not later than 10 February 1969.

H.3. Major Experimental Phase - Aquanaut Occupation of the Habitat: This is PHASE III which is scheduled to run for 60 days beginning about 10 February 1969 and ending about 15 April 1969. The execution of these operations requires a detailed intermeshing of programs to ensure

ANNEX H

coordination for safety of operation, technical engineering surveillance, logistics support and the conduct of the scientific missions. This degree of coordination is best achieved by an integrated program schedule of events required in each area on a daily basis: such a document has been issued separately under the title "Integrated Ocean Floor Program - TEKTITE I." Sample pages from this detailed plan are found in APPENDIX I.

H.3.a. Scientific Program: Integrated.

1. Marine Science Research Program: Integrated.
2. Behavioral Science Program: Integrated.
3. Biomedical Science Program: Integrated.

H.3.b. Engineering and Technical Surveillance: Integrated.

H.3.c. Logistics Support: Integrated.

H.3.d. Surface Support Operations Watch structure is covered in APPENDIX II to ANNEX J.

H.4. Equipment Withdrawal and Dispersal: This is PHASE IV of the overall program which will commence shortly after completion of PHASE III.

A detailed plan of operations for this phase has been issued separately and will be distributed to participating activities.

H.4.a. Commence Withdrawal and Dispersal: About 20 April 1969.

H.4.b. Complete Withdrawal and Dispersal: About 1 May 1969.

H.5. Reduction, Analysis and Distribution of Data and Reports: This is PHASE V of the overall program which will commence upon completion

ANNEX H

of all other phases about 1 May 1969 and will be completed about 1 September 1969.

H.5.a. Marine Science Data Analysis: Coordinated under the Department of the Interior.

H.5.b. Behavioral Science Data Analysis: Coordinated under the Office of Naval Research.

H.5.c. Biomedical Science Data Analysis: Coordinated under the Office of Naval Research.

H.5.d. Engineering Data Analysis: Coordinated under the General Electric Company.

APPENDIX I TO ANNEX H
INTEGRATED OCEAN FLOOR PROGRAM - TEKTITE I

Day 1

0800	Habitat certified ready for occupation
0900	Scientific team occupies habitat
0930-1200	Emergency drills
1200-1300	Lunch
1300-1700	Marine science studies
1700-1800	Habitat engineering evaluation Check emergency air bottles Change Baralyne
1800-1900	Supper Crew conference
1900-1930	Medical status examination
1930-2100	Marine Science studies Change tanks Transfer samples to surface Psychomotor test
2100	Secure operations Set night watch
2130	Mood Adjective Checklist Attach EEG leads on Waller, Vanderwalker, Clifton
2200	Crew retires

APPENDIX I TO ANNEX H
INTEGRATED OCEAN FLOOR PROGRAM - TEKTITE I

Day 5

0500-0630	Microbiological skin samples Microbiological air samples Microbiological habitat samples Hematological samples Transfer samples to surface
0630 - 0800	Breakfast Change Baralyne
0800-1200	Pulmonary ventilation EKG studies
1200-1300	Lunch
1300-1500	Additional time for Biomedical Experiments if needed
1500-1700	Marine science studies
1700-1800	Habitat Engineering Evaluation Check emergency air bottles Change Baralyne
1800-1900	Supper Crew conference
1900-1930	Medical Status Examination
1930-2100	Marine science studies Change tanks Transfer samples to surface Psychomotor test
2100	Secure operations Set night watch
2130	Mood Adjective Checklist Attach EEG leads on Waller, Vanderwalker, Clifton
2200	Crew retires

APPENDIX I TO ANNEX H
INTEGRATED OCEAN FLOOR PROGRAM - TEKTITE I

Day 17

0500	Marine science study
0800	Breakfast Change Baralyme Psychomotor test
0830-1200	Marine science studies
1200-1300	Lunch
1300-1700	Marine science studies
1700-1800	Habitat Engineering Evaluation Check emergency air bottles Change Baralume
1800-1900	Supper Crew conference
1900-1930	Medical Status Examination
1930-2100	Marine science studies Change tanks Transfer samples to surface
2100	Secure operations Set night watch
2130	Mood Adjective Checklist Attach EEG leads on Waller
2200	Crew retires

APPENDIX I TO ANNEX H
INTEGRATED OCEAN FLOOR PROGRAM - TEKTITE I

Day 59

0500	Marine science study
0800	Breakfast Change Baralyme
0830-1200	Marine science studies
1200-1300	Lunch Psychomotor Test
1300-1700	Marine science studies
1700-1800	Habitat Engineering Evaluation Check emergency air bottles Change Baralyme
1800-1900	Supper Crew conference
1900	Medical Status Prepare to evacuate habitat
2100	Secure operations Mood Adjective Checklist Set night watch
2200	Crew retires

APPENDIX I TO ANNEX H

INTEGRATED OCEAN FLOOR PROGRAM - TEKTITE I

Day 60

0400	Evacuate habitat
0430 (about)	Begin Decompression
2400 (about)	Complete Decompression

ANNEX J

ANNEX J

ADMINISTRATION

J.1. Routine Administrative Matters: Covered in a "Base Camp Routine/Regulations" manual issued by the Officer in Charge of Construction (OICC) during PHASE II. Upon commencement of PHASE III, the OICC becomes the Support Officer (refer to ANNEX B) and the existing manual will be re-issued by the Project Director with appropriate modifications. A copy of this manual (modified) is attached as APPENDIX I to this ANNEX.

J.2. Watch Structure: See APPENDIX II to this ANNEX.

J.3. Security: Lameshur Bay is not a military restricted area; however, the Project Director may limit access to the site should the situation so warrant.

J.4. Mail: Surface delivery of mail may be expected to require up to two months for delivery: for this reason, it is essential that AIRMAIL delivery be specified. The postal address should be:

PROJECT TEKTITE - Special Dispatch
c/o Postmaster, Charlotte Amalie
St. Thomas, Virgin Islands 00801

J.5. Weather: See APPENDIX III to this ANNEX.

J.6. Reports and Records: See APPENDIX IV to this ANNEX.

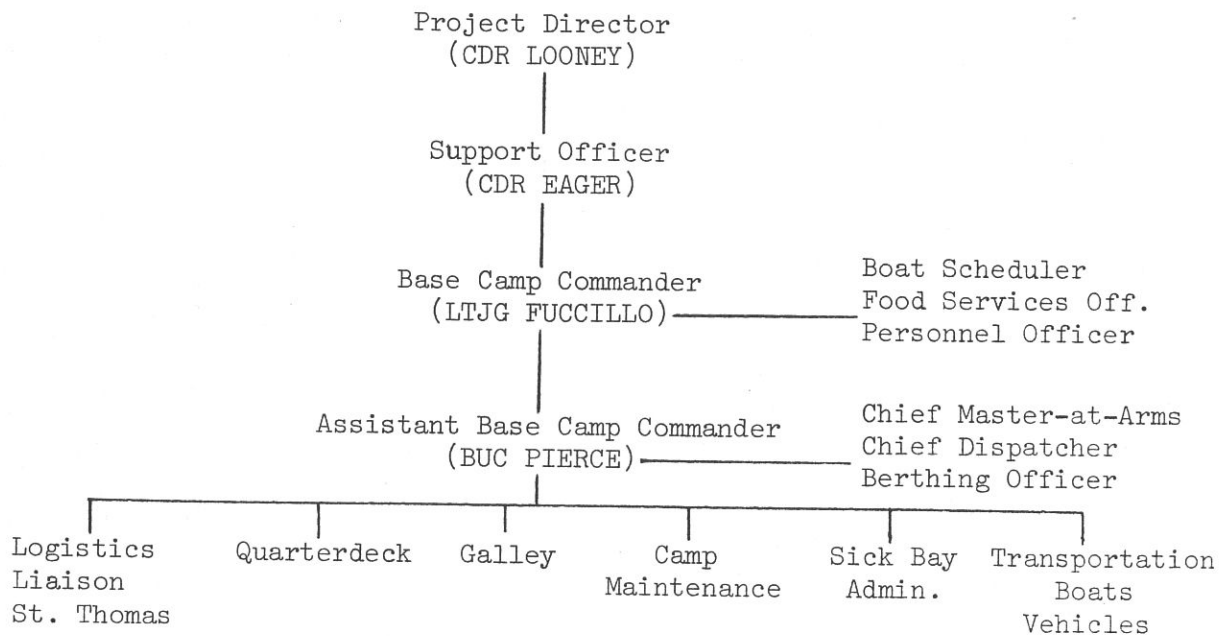
APPENDIX I TO ANNEX J

BASE CAMP ROUTINE/REGULATIONS

1. I would like to take this opportunity to welcome all personnel to the TEKTITE I Base Camp. I do hope that your stay here will be both productive and pleasant, for yourself and for all personnel working on the project.

2. Since TEKTITE I is an Interagency project with the management responsibility of the U.S. Navy, the Navy is responsible for the safety and well-being of all personnel working on it. The TEKTITE team, which you are a part of, is a conglomeration of many different organizations working towards a common goal. To reach this goal, a team effort, cooperation and organization are required and this necessitates a set of Base Camp regulations which will be adhered to in order to insure a smooth operation.

3. First of all, our chain of command in the Base Camp is as follows:



APPENDIX I TO ANNEX J

4. Our routine of the day is as follows:

0600	Reveille
0630-0700	Breakfast, First Sitting
0700-0730	Breakfast, Second Sitting
0730	Quarters for military personnel
1130-1200	Dinner, First Sitting
1200-1230	Dinner, Second Sitting
1715-1745	Supper, First Sitting
1745-1815	Supper, Second Sitting
2200	Galley Closed, Taps

5. Berthing: Bunks will be assigned to each organization by the Berthing Officer. It will be up to the senior man of each organization to assign specific bunks to his people. The cleanliness of each barracks is the responsibility of the people living in it; no housekeeping services will be supplied. Cleaning gear and linen will be issued by the Master-at-Arms. Personal fans, radios, and other electric appliances will be allowed in the barracks provided our generators and power lines can carry the load. Alterations and extensions to the existing wiring system are not authorized for any reason.

6. Food: Due to the number of people living in the Base Camp, meal hours have been broken up into two sittings. When checking into the Base Camp, you will be assigned either the first or second sitting by the Food Services Officer, based upon your desires and availability of space in the mess hall.

APPENDIX I TO ANNEX J

a. Costs of meals for officer and civilians are as follows:

	Officers and Civilians on Government Per Diem	Civilians <u>Not</u> on Government Per Diem
Breakfast	\$.45	\$.35
Dinner	1.10	.70
Supper	<u>.95</u>	<u>.50</u>
Total	\$2.50	\$1.55

b. You are requested to keep track of your own meals by initialing a chart held by the Messdecks Master-at-Arms. Bills will be paid on Fridays, or upon permanently leaving the Base Camp, to the Food Services Officer or his designated representative.

7. There are two water systems at the Base Camp: Fresh and slightly brackish.

a. The fresh water is barged in from St. Thomas and is for the use of the galley, sickbay, and the laboratories, and is not to be used for personal hygiene.

b. The brackish water comes from a well and is fed to the showers. This water is to be used for washing only. Since the well output is far below expectations, you are requested to take Navy-type showers to conserve water. If we find that we are losing water due to unauthorized "Hollywood" showers, water hours will be put into effect.

8. Vehicular Transportation:

a. No military vehicle will be driven by anyone not holding a valid Government driver's license. Each vehicle will be assigned a specific driver by the Chief Dispatcher.

APPENDIX I TO ANNEX J

b. For trips between the Base Camp and the causeway pier, a shuttle run will be maintained during the following hours:

(1) 0745-0830: 1115-1245: 1600-1730.

(2) Transportation will not normally be provided to supplement these shuttle runs.

c. For trips to Cruz Bay, St. John, a truck will be dispatched from the Base Camp at 1130 daily, as required. It will arrive at the National Park Service pier in Cruz Bay at 1215. Upon completion of official Base Camp business in Cruz Bay, the truck will stop back at the Park Service pier and then return to Lameshur Bay (Base Camp).

d. Requests for special use of vehicles will be submitted to the Chief Dispatcher. Trips outside the park area must be for official business and must be authorized by the Base Commander. Remember, we do have a shortage of vehicles and we will not be running personal taxi service.

9. Boat Transportation:

a. A boat will be run between Lameshur Bay, St. John and Red Hook, St. Thomas, as required, on the following schedule:

	Arrive	Depart
Lameshur Bay		0800
Red Hook	0845	0915
Lameshur Bay	1000	1500
Red Hook	1545	1600
Lameshur Bay	1645	

There will be no special boat runs except as authorized by the Project Director or Support Officer.

APPENDIX I TO ANNEX J

b. The Senior Line Officer riding in any naval boat has the responsibility for that boat and all personnel riding in it. He will direct the loading and placement of all personnel in that boat and will enforce any safety regulations which he deems necessary. In the absence of a Line Officer on a boat, the boat coxswain is considered "captain of his ship" and has these same duties and responsibilities.

10. Transportation in general:

a. In the above paragraphs, "as required" means that the Quarterdeck knows in advance that someone is making a trip or someone is to be picked up. If information as to the need of a specific boat or vehicle run is not received by the Quarterdeck at least 15 minutes before the scheduled departure of that run, it will be cancelled by the Chief Dispatcher. It is hoped that this will eliminate any unnecessary boat or vehicle runs.

b. With the above in mind, it is requested that all personnel going to Red Hook and Cruz Bay sign the "Out-of-Area Log" on the Quarterdeck, stating destination, means and time of departure and return. Personnel will also be required to log in upon return.

c. Personnel in Red Hook or Cruz Bay who have not signed the "Out-of-Area Log" or have missed the run which they have signed for, should get in touch with the Base Camp via available means which will be promulgated.

APPENDIX I TO ANNEX J

d. For information: There is a ferry which runs between Red Hook and Cruz Bay on an hourly basis at a cost of \$1.00.

11. Liberty: Each organization will arrange its own liberty schedule around the boat schedule. Cruz Bay, St. John, cannot absorb a large liberty party and is therefore off-limits, except as authorized by the Project Director.

12. Recreational Swimming: Swimming during off-hours will be permitted only at the National Park Service at Little Lameshur Bay. All personnel will be required to use the "buddy system" while swimming, and no swimming will be permitted between sunset and sunrise.

13. Plan of the Day: We would like to keep everyone informed of the progress of the project as it happens. The Base Camp Commander will put out a Plan of the Day each morning, reviewing our progress for the previous day. The POD will also serve to promulgate modifications to the boat schedule and the routine of the day, and will be a day-to-day log of the project.

APPENDIX II TO ANNEX J

WATCH STRUCTURE

An alert watch will be set at all times following the commencement of ocean floor operations until the completion of the mission. This watch will consist of necessary scientific, medical, engineering, and support personnel as the situation dictates. The watch must be capable of coping with the initial stages of any possible emergency as well as rendering necessary surface support for habitat personnel. The Director of each watch section will report directly to the Project Director and will keep him informed of all important or unusual events. All personnel in the watch section will stand an alert watch at their designated station and will not leave their station until properly relieved or have received permission from the Watch Director to leave their station. They shall keep the Watch Director informed of all important or unusual events. The watch section will be modified from time to time as necessary for optimum support of the habitat. The Support Officer will establish such watches as he deems necessary to insure the smooth operation of the base camp and to supply support personnel to the basic mission watch. The senior Medical Officer will establish an appropriate medical watch for the base camp. All watch lists are subject to approval by the Project Director. The basic watch will consist of the following stations:

APPENDIX II TO ANNEX J

WATCH ORGANIZATION:

Control Center

Watch Director
Medical Watch
Scientific Watch
Systems Engineer

Support Barge

Machinery Watch

Crane Barge

Crane Operator
Rigger
Support Divers (2)
Boat Crew (when required)

Base Camp

Communications Watch
Others (as required)

Habitat

Aquanaut Watch

DUTIES OF THE WATCH

Control Center

Watch Director: Assumes overall direction of watch section.

The Watch Director will insure all watch personnel are on station, alert, and have been thoroughly instructed in their duties. He will keep the Project Director fully informed of all important or unusual events. He will insure that mission events are carried out as scheduled and if

APPENDIX II TO ANNEX J

unable to comply with the established schedule will immediately notify the Project Director. He will brief and drill each watch section on emergency procedures insofar as practical. He is responsible for the safety of the aquanaut personnel as well as the watch personnel.

Medical Watch: The medical watch will advise the Watch Director on the medical safety of divers and will perform those duties necessary to ensure that safe medical practices are adhered to. In addition, he is responsible for carrying out the scheduled Biomedical Experiments Program and coordinating any changes therein with the Scientific Team Leader. He must also be prepared to assume supervision of the decompression complex in case of emergency and to render emergency medical treatment either topside or in the habitat.

Scientific Watch: Will be responsible to the Watch Director to insure that the scheduled scientific mission is carried out. Any events or occurrences affecting the scientific mission are to be reported to the Watch Director.

Systems Engineer: Will be responsible for continuously monitoring the habitat support system. He will keep the Watch Director advised at all times on the condition of the habitat support system and will inform the Watch Director immediately of any actual or anticipated malfunctions.

APPENDIX II TO ANNEX J

Support Barge

Machinery Watch: This watch will insure that all support and emergency machinery is operable at all times. He will continuously monitor and service all machinery as well as carry out scheduled rotation of equipment. Prior to relieving, he will ascertain the condition of all machinery, its fuel level and other service requirements. He will test all stand-by machinery during each watch as scheduled. He will report any malfunction or anticipated problems to the Watch Director immediately.

Crane Barge

Crane Operator: He will maintain an alert standby watch to render routine support to the habitat as required and to react instantly in case of an emergency. He will thoroughly familiarize himself with all handling aspects of the decompression complex. He will test the crane machinery at the beginning of each watch and during the watch as necessary to ensure reliable operation. He will service, operate, and maintain all machinery on the crane barge.

Rigger: He will maintain an alert standby watch to render routine and emergency support to crane operations. He will be qualified to rig and lower the personnel transfer capsule (PTC) and to mate the PTC with the deck decompression chamber (DDC).

APPENDIX II TO ANNEX J

Support Divers: Two standby divers will stand an alert watch at all times to render routine surface support to the habitat and to respond to the initial stages of any emergency situation. The Senior Diver will insure they maintain their diving equipment in a high state of readiness at all times and have sufficient standby equipment to cope with any emergency. They will keep one 7-man rubber raft with outboard motor at the diving station at all times and ensure it is fueled and ready with spare fuel on hand. When mission routine requires that the divers cover long excursions, thus requiring an escort surface craft, a second set of standby divers will be required on the crane barge equipped as above. Divers will be qualified to operate the decompression complex and all divers will be drilled periodically as necessary to maintain such qualifications. They will stand ready to assist the Medical Watch as required. All divers will be fully indoctrinated and drilled in emergency procedures prior to being assigned to this watch.

Boat Crew: The boat crew will stand an alert watch when required. The coxswain will insure that the boat is equipped with all necessary emergency equipment and is fueled and serviced as necessary.

Base Camp

Communications Watch: This watch will maintain communication with the control center as well as outside communications and interior communications within the base camp. He will be fully indoctrinated and drilled in the Emergency Procedures Plan prior to being assigned to this watch. He will be prepared to alert those personnel involved in

APPENDIX II TO ANNEX J

emergency conditions. He will not communicate any emergency with outside stations except as released by the Project Director.

Others: Other base camp watches will be established on-site by the Support Officer subject to approval by the Project Director.

Habitat

Aquanaut Watch: One aquanaut will man the Habitat Operations Center. The Aquanaut Watch will ensure that the Watch Director is kept informed of the status of all personnel, activities and equipment on the ocean floor.

APPENDIX III TO ANNEX J

WEATHER

A. General: Historically, the weather outlook for Lameshur Bay for the period of the mission is ideal. The frequency of storms over the past sixty years has been practically nil and the prevailing trade winds are from ENE at a mean velocity of about 12 knots. The mean temperature for January-April is about 77°F with the high generally in the low 80's and the low in high 60's or low 70's. It is not anticipated that adverse weather will be a factor in the execution of Project TEKTIME; however, up-to-date data must be available for any possible contingency. In order to have the best information available, the Fleet Weather Facility at Jacksonville, Florida, will be requested to furnish weather and sea forecasts for Lameshur Bay at 24-hour intervals. This information will be routed through either the teletype facility at the Coast Guard Station, ST. Thomas, or via SSB voice communications from Roosevelt Roads. A Navy Weather Service Environmental Detachment from Jacksonville FWF is located at Roosevelt Roads.

B. Foul Weather Procedure: In the unlikely event that foul weather occurs, the first concern is for the aquanauts' safety. The decision to evacuate the habitat and abort the mission will be the decision of the Project Director based on all factors involved. Since the support barge is supported on pilings above the surface of the water and the habitat is on bottom well protected by reef formations,

APPENDIX III TO ANNEX J

it would take seas of near gale proportions to consider aborting the mission. The weak link in the system is the crane barge containing the decompression complex. Swells of over six feet would seriously jeopardize operation from the standpoint of the crane barge and other small craft. The procedures for abort are contained in the overall Safety Plan. In the event that an abort is executed, preparations will be made to move all small craft and the decompression/crane barge to a safe haven until conditions improve. The crane barge shall be rigged for towing and a 6" nylon towing hawser shall be provided for towline. Depending on advance warning, the following two conditions will be considered.

1. Twenty four hour warning
 - a. Evacuate aquanauts and place in decompression chamber.
Rig barge for towing.
 - b. Upon completion of decompression, move aquanauts to personnel boat accompanied by medical staff.
 - c. Tow barge to Hurricane Hole or another Bay as the situation dictates ensuring sufficient fuel for decompression system is on board. Tow craft will be an LCM6, with additional LCM6 accompanying as standby tow craft. Personnel Boat to accompany two as well as all other small craft.

APPENDIX III TO ANNEX J

- d. Anchor or dock crane barge as appropriate with decompression complex in standby with adequate personnel to operate located nearby in case decompression treatment is required.
- e. Place protective cover on support barge.
- 2. Less than twenty four hour warning: If less than twenty four hours warning but more than six hours, the following action will be taken.
 - a. Evacuate aquanauts and place in decompression chamber. Rig barge for immediate tow.
 - b. Tow barge to safe haven as indicated above with aquanauts embarked in decompression chamber. All medical and operating staff embarked on barge. Adequate fuel will be on board for length of decompression plus enough for treatment if required.
 - c. Anchor or dock crane barge as appropriate and complete decompression.
 - d. All small craft will accompany crane barge.
 - e. Place protective covers on support barge.
- 3. Less than six hours notice
 - a. Evacuate aquanauts and place in decompression chamber. Medical and operating staff embarked.

APPENDIX III TO ANNEX J

- b. Move crane barge to center of inner Lameshur Bay and anchor on at least 10 to 1 scope. Sufficient fuel must be on board for decompression.
- c. Trail personnel boat astern of barge with boat crew embarked.
- d. Decompress aquanauts at anchor and ride out storm on crane barge.
- e. Place protective covers on support barge.

The Project Director will be on scene and direct any of the above procedures assisted by the Assistant Director, Support Officer, and appropriate medical/operator staff. The Support Officer will detail personnel to secure the support barge and base camp as necessary. All other personnel not required in securing operations will proceed to the base camp and remain on standby status to render such other assistance as may be required.

APPENDIX IV TO ANNEX J

REPORTS AND RECORDS

While it is desirable to minimize the paperwork involved with the project, there are certain records and reports required in order to keep all concerned informed and to preserve records for future use. The following records and reports will be made or maintained:

a. Situation Reports ("SITREPS"):

Upon the start of Phase III, daily SITREPS will be made until completion of the mission. Additional SITREPS will be made as the situation warrants.

b. Program Reports

Each Program Manager will submit a post mission report covering all phases of his agency's participation in the mission. The report shall contain a narrative report of significant events along with comments and recommendations. Program managers will be responsible for insuring that feeder reports from the numerous subsections are submitted to them for incorporation into the overall program report.

c. Logs

(1) Project Log: The Watch Director will maintain a chronological account of all significant events including the accomplishment or non-accomplishment of mission objectives. This log will be mission-oriented and will contain sufficient detail to enable the writers of the overall mission report to readily transcribe the log into a comprehensive report.

APPENDIX IV TO ANNEX J

(2) Base Camp Log: A base camp log will be maintained similar to a Station Journal. It will contain all items of significant interest for future use or reference. Of particular interest are visits of important personages, injuries, sickness, etc. The log shall be kept on a chronological basis.

(3) Habitat Log: A chronological log of happenings in and around the habitat will be kept by the Aquanaut Watch.

